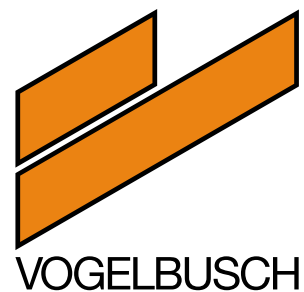
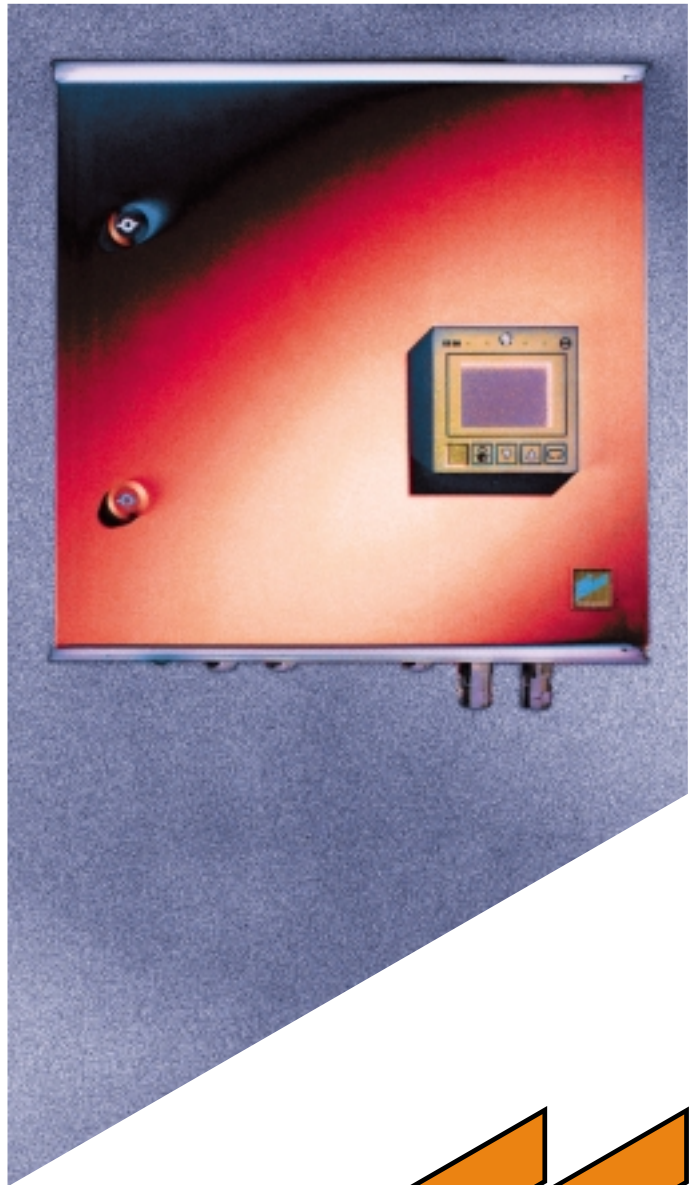


# IR-SD 2/2

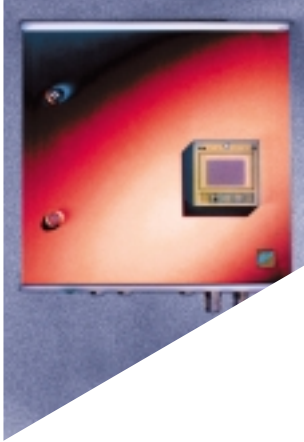
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## alcohol analyser

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w e m a k e b i o t e c h n o l o g y w o r k



## Vogelbusch IR-SD 2/2 alcohol analyser

*This gas analyser is designed for on-line determination of the actual ethanol concentration during alcoholic (yeast) fermentations. The system permits the observation of ethanol formation in real time without sampling, and analysis as well as detection of the final point of fermentation in batch fermentations.*

*In addition to the IR-SD 2/2 Vogelbusch provides different types of alcohol analysers which are used also for pichia yeast fermentation and in the yeast and vinegar industry.*

### General

In its standard design, one instrument is capable of on-line detection of ethanol in two (parallel operating, independent) fermenters; for specific applications a single channel version can also be provided. The following description applies for the dual channel (2-fermenter) design and operation.

The IR-SD 2/2 is designed for field installation between two fermenters. The location should be vibration-free (preferably mounted on a wall).

Detection of ethanol is performed by an infrared sensor element which comes into contact with ethanol-enriched air passing a probe immersed in the fermenting mash.

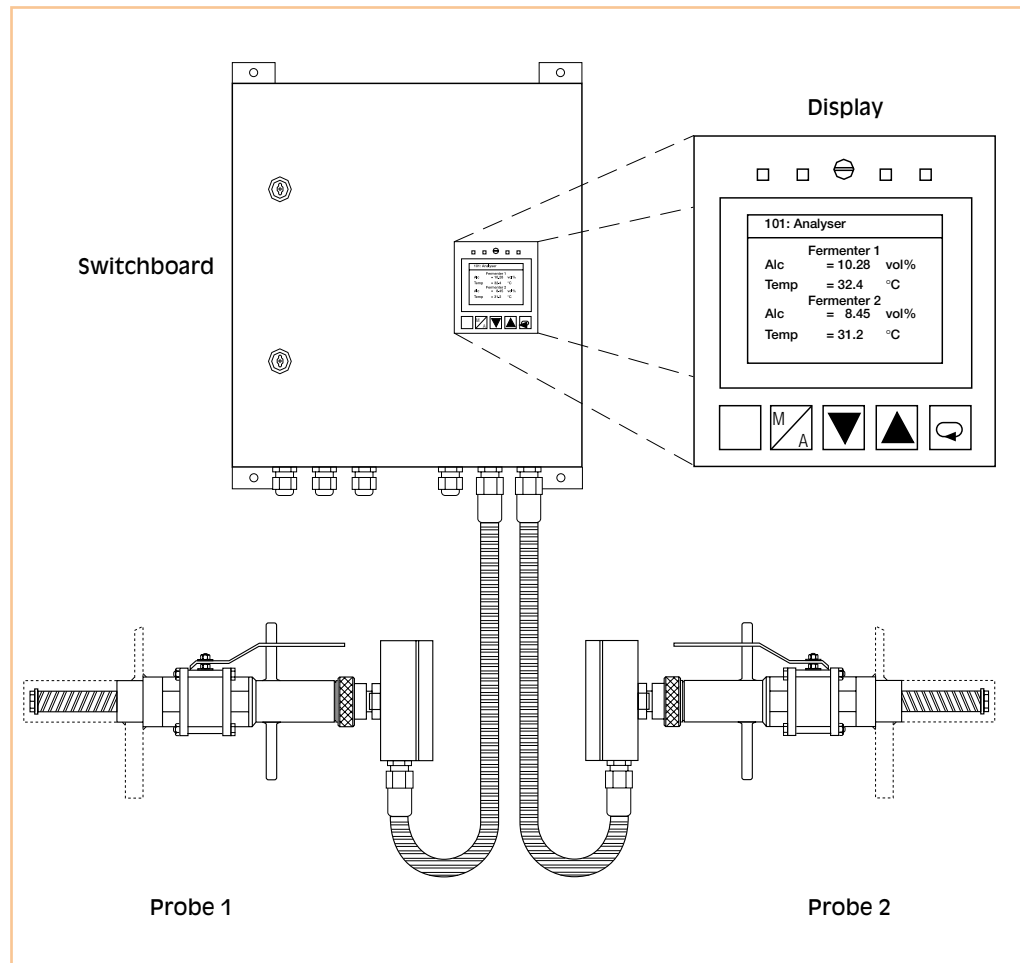
### Function

Instrument air is pressure-adjusted and conducted through the probe placed in the fermentation mash. The probe is covered with a silicon diaphragm, so that while passing the probe the air stream is enriched with ethanol diffusing through

the diaphragm. The IR sensor registers a signal which is dependent on the ethanol concentration and the velocity of the constant air stream. The corresponding alcohol concentration in the fermentation mash is calculated from the signal change compared with zero calibration.

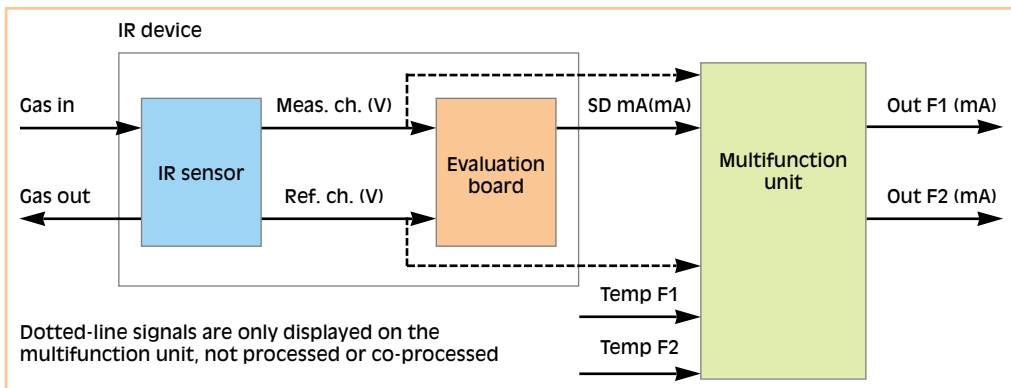
Simultaneous measuring in two fermenters, as well as calculation, with automatic, individual temperature compensation, considering actual raw material (vapour pressure) effects is carried out by the integrated programmable logical controller. Additional features of the multifunction unit include visualisation of data and the operation panel for communication.

The calculated ethanol concentration is indicated on the LCD display of the instrument with a resolution of 0.01% vol. and converted to a standard current output signal (4 - 20mA) which can be used as input signal for any PCS or visualisation/documentation.



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## Signal flow



## Installation

The instrument is designed for field use in the vicinity (< 5 m) of two fermenters.

Necessary provided services:

230V power supply

Instrument air ( $\geq 4$  bar)

(electrical connections for further signal use)

Necessary installations for probe:

A 43 mm diameter hole must be provided in the fermenter shell (located in a well-mixed area of the fermenter, with the silicon tube probe being permanently immersed in the liquid during fermentation).

A connection with a ball valve is welded into the hole to serve as mounting port for the probe, so that the probe can be inserted via the ball-valve and also removed while the fermenter in operation; all parts mentioned above are included in the standard scope of delivery.

## Calibration

The instrument is delivered with pre-installed temperature compensation and the calibration function for alcohol/water mixtures in a range of 0 to 15 vol% or, optionally, 0 to 5 vol%.

The correction factor for compensation of raw material effects used can be easily determined and modified by client on site.

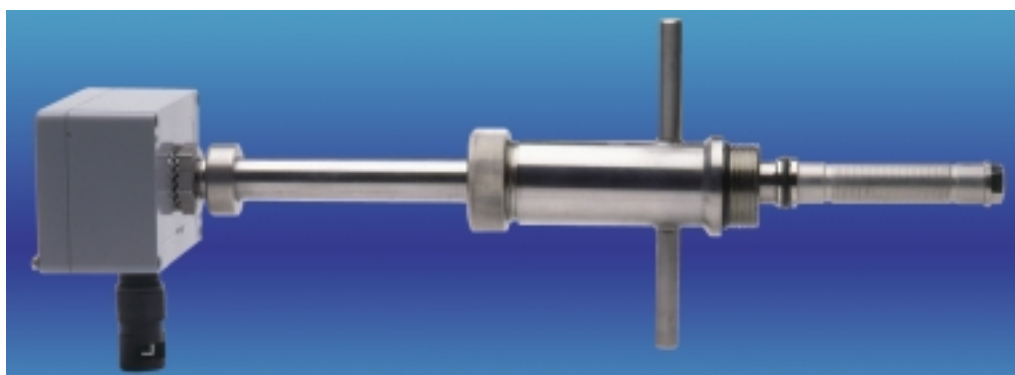
## Technical data:

Weight:	10 kg (switchboard)
Dimensions:	400 x 400 x 200 mm (H x W x D) (switchboard)
Power supply:	230V / 50Hz
Instrument air supply (4 bar g):	2Ndm <sup>3</sup> /h
Power consumption: (230V AC) approx.	50W
Operating range:	standard: 0-15 vol% ethanol (other ranges selectable)
Precision:	$\pm 0.2$ vol% ethanol
Reproducibility:	$\pm 0.05$ vol% ethanol
Ambient temperature:	0 - 45 °C

## Reference Installations

Nedalco B.V., Netherlands

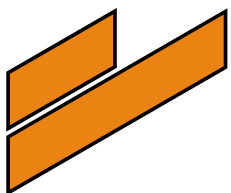
Eridania S.p.A., Italy



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